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A Phase I Archeological Survey of Six Proposed Spoil Areas
for the Highway 313 Road Construction
on the Fort Knox Military Reservation,
Hardin County, Kentucky

Kentucky Department of Transportation
Project Number SSP 047 08547

November 1993

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ABSTRACT

In October 1993, the Fort Knox Staff Archeologist conducted a Phase I archeological survey of approximately 1.6 ha (4 acres) and a literature review of an additional 3.2 ha (8 acres) in six proposed soil spoil areas on the Fort Knox Military Reservation, Hardin County, Kentucky. Four of the spoil areas had been previously surveyed with negative results, and were not field inspected in the current study. The two spoil areas not previously surveyed were field inspected. The survey resulted in the discovery of no archeological materials or deposits. It is recommended that the spoil areas be used as proposed.

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MANAGEMENT SUMMARY

In accordance with Executive Order 11593 and other applicable federal laws and regulations, a Phase I archeological study was conducted of six proposed soil spoil areas on the Fort Knox Military Reservation, Hardin County, Kentucky. A literature search revealed that four of the six proposed spoil areas had been previously surveyed with negative results. These four areas were not field inspected in this project. The two proposed spoil areas not previously surveyed were field inspected, with negative results. It is recommended that the spoil areas be used as proposed.

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I. INTRODUCTION

In October 1993, the Fort Knox Staff Archeologist was requested to perform a Phase I archeological survey of six proposed soil spoil areas at Fort Knox, Hardin County, Kentucky (Figure 1). Proposed Spoil Areas 1 through 5 are located in Hunting Area 81 and Spoil Area 6 is located in Hunting Area 83. Each spoil area is approximately 2.0 acres (0.8 ha) in size. The spoil areas will be used by the Larry Glass Construction Company, Inc., which is constructing Segment 3 of Highway 313 under contract to the Kentucky Department of Transportation. The spoil placed in the spoil areas will be excavated from the Fort Knox portion of the Highway 313 easement. The Phase I survey of Highway 313 easement was conducted in 1986 by DiBlasi (1986), and additional work has been conducted at some of the sites by Ruple (1992a), Hixon (1992), and by archeologists with Wilbur Smith Associates (Fenton 1993: personal communication).

During the period July through August, 1993, the Staff Archeologist obtained copies of all of the state site forms for sites on the Fort Knox installation from the Office of State Archaeology (OSA), University of Kentucky, Lexington, and of all reports of previous investigations on the installation or immediately adjacent to the installation from various sources. She also updated the site files by comparing the cultural resources quadrangle maps against the quadrangles on file at the OSA. All documents necessary to perform Phase I literature searches for the installation are present at the Cultural Resource Management Branch of the Directorate of Public Works, Fort Knox, and no file check was made with the OSA specifically for this project.

A literature search revealed that four of the six spoil areas had been previously surveyed with negative results. Spoil Areas 1 through 3 lie within the corridor of multiple alternative alignments for Highway 313 surveyed by DiBlasi (1986). Spoil Area 4 lies within one of the areas surveyed by O'Malley et al. (1980). Because Spoil Areas 1 through 4 had been previously surveyed, with negative results, they were not field inspected in the current study. Spoil Areas 5 and 6 had not been previously surveyed, and were field inspected in the current study.

The six proposed spoil areas are located in the Plain section of the Pennyryle cultural landscape, on the tops and slopes of dissected ridges. Spoil Areas 1 through 3 and Spoil Area 5 lie in the ravines between adjoining ridges, while Spoil Area 4 and 6 are located on ridge tops. Elevations in the spoil areas range from 690 to 835 feet. Soils in Spoil Areas 1 through 4 are classified as Criders-Vertrees-Nicholson soil association while soils in Spoil Areas 5 and 6 are classified as Garmon-Caneyville-Nicholson (Arms et al. 1979: General Soil Map). Drainage in all of

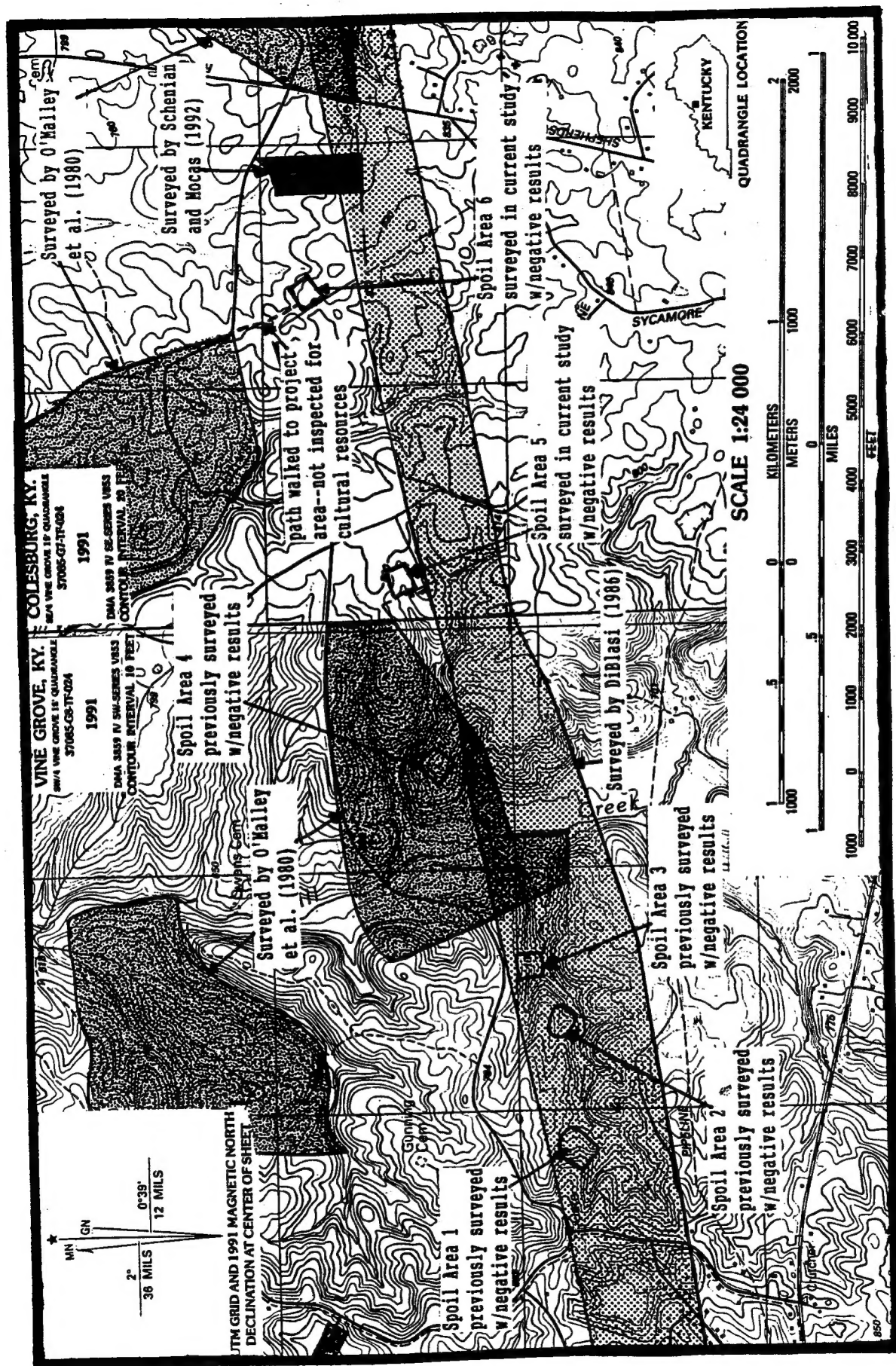


FIGURE 1. Location of Proposed Spoil Areas 1 Through 6.

the spoil areas is into Mill Creek or its tributaries Douglas Branch or Dorrets Run. Mill Creek is a tributary of the Salt River.

The archeological survey was conducted in preparation for the use of the spoil areas for the deposition of excess fill outside the 313 easement by Larry Glass Construction Company, Inc. The Kentucky Department of Transportation project number is SSP 047 08547. The archeological survey and literature review were required to comply with the National Environmental Protection Act, or NEPA, (Public Law 91-190), the Historic Preservation Act of 1966, as amended (Public Law 89-665), the Archaeological Resources Protection Act of 1979 (Public Law 96-95), Presidential Executive Order 11593, and Army Regulation 420-40.

Spoil Area 6 was inspected on October 8, and Spoil Area 7 was inspected on October 12, 1993. A total of three person hours were spent in the survey of the two spoil areas. No artifacts were collected in this survey. Documentation of this project will be curated at the Archeology Laboratory, University of Louisville, on a "permanent loan" basis, under contract number DABT 23-93-C-0093, for curatorial and technical support (copy of contract on file, DPW, Fort Knox, Kentucky). Duplicate copies of the documentation will be stored at the Directorate of Public Works (DPW), U.S. Army Armor Center and Fort Knox, Fort Knox, Kentucky.

II. PREVIOUS RESEARCH

A number of cultural resource management (CRM) projects have been conducted on the Fort Knox military reservation. Numerous projects also have been conducted in the portions of Bullitt, Meade, and Hardin Counties outside the military reservation, according to the state archeological bibliography and updates. O'Malley et al. (1980) provide an in-depth discussion of research in Bullitt, Hardin, and Meade counties through 1979, and Schenian (1991) and Schenian and Mocas (1992) provide a summary of the research which has taken place since the O'Malley et al. (1980) study was completed. This section will focus on the projects which have been conducted on the military reservation and within the vicinity of the current project areas.

There are 112 Hunting Areas on the Fort Knox installation. O'Malley et al. (1980) surveyed approximately one-quarter of each of the 96 hunting areas which did not contain grenade ranges. O'Malley et al. (1980) recorded 415 sites (15Bu295 through 15Bu410, 15Hd109 through 15Hd294, and 15Md103 through 15Md242). Some of these sites were recorded outside the official survey areas, and were discovered while gaining access to the selected survey areas from the closest access road. Some of the sites are isolated finds. O'Malley

et al. (1980) did not formally evaluate the National Register status of any of the sites inspected, although opinions are offered on many of the site forms. The purpose of the O'Malley et al. (1980) study was to provide a preliminary inventory of portions of the installation and to develop a database for the predictive modeling of site locations on the installation, and not to evaluate sites for a task-specific construction project. Holmberg (1991) prepared an archival study on the four mill sites (15Md164, 15Md176, 15Md185, and Grahamton) recorded by O'Malley et al. (1980) in the Meade county section of the base. Holmberg's (1991) study includes an appendix (Ball 1991a) delimiting a scope of services for the testing of the mill sites. This testing has not yet been conducted.

A number of projects have been conducted in conjunction with proposed timber harvests. Bush et al. (1988) revisited 15Bu319 and recorded sites 15Bu438 through 15Bu446 and 15Bu485 through 15Bu491 in their survey of timber areas in Hunting Areas 41, 42, and 52. Myers (1990) surveyed 287 acres in Hunting Area 95, recording 15Bu495 through 15Bu502, and describing modern house and garbage dump sites. Mueller (1991) surveyed 270 acres in Hunting Area 1, revisiting 15Md11, 15Md152, and 15Md159, and recording 15Md322 through 15Md325, two historic cemeteries, five prehistoric isolated finds, and three modern structures. Schenian and Mocas (1992) surveyed 600 acres and attempted to relocate and flag previously recorded sites in an additional 300 acres. Their project areas consisted of 14 timber parcels located in Hunting Areas 13, 74, 76, 77, 78, 81 through 84, and 88 through 90. This survey resulted in the recording of sites 15Hd462, 15Hd463, 15Hd464, 15Md326, and one isolated find, and the revisiting of 15Hd140. Attempts were made to relocate 15Hd18, 15Hd113, and 15Hd139, but were unsuccessful. Ruple (1992b) revisited sites 15Md152, 15Md153, and 15Md322 in Hunting Area 1. Ruple (1992a) revisited sites 15Hd184, 15Hd186, and 15Hd249, and made an unsuccessful attempt to relocate 15Hd248, in order to flag avoidance boundaries around the sites in Hunting Area 90 in preparation for logging activities in conjunction with the clearing of the Highway 313 easement. Ruple (1993a) surveyed all 813 acres comprising Hunting Area 4 in preparation for timber harvests in scattered parcels within the Hunting Area.

The improvement of facilities on the Fort Knox installation has resulted in several CRM studies. Sorensen and Ison (1979) surveyed a proposed telephone building expansion site and access road in the cantonment area, recording no sites. Sussenbach (1990) surveyed three weather radar installation sites, in Hunting Area 23, discovering one prehistoric isolated find. Ruple (1993b) surveyed approximately 10 acres in the cantonment area for a shoreline maintenance project, encountering no sites.

The development, expansion, or improvement of training areas has resulted in a number of CRM studies. Driskell and O'Malley (1979) surveyed the Wilcox Gunnery Range, recording sites 15Bu393 through 15Bu397. Schenian (1991) surveyed 116 acres in portions of Hunting Areas 17, 30, and 41, in conjunction with the Fort Dix realignment, re-examining 15Bu303, and recording 15Bu492, 15Hd459, and two prehistoric isolated finds. Hemberger (1991) also surveyed approximately 405 acres in seven construction sites in Hunting Areas 17, 24, 31, 32, 34, and 54, in conjunction with the Fort Dix realignment. This study resulted in the recording of 15Hd461 and 15Bu504, the revisiting of 15Bu299 and 15Bu385, and the unsuccessful attempt to relocate previously recorded site 15Hd274. Hemberger (1991) surveyed a total of 126 acres in four proposed construction areas in the Yano Tank Range, in Hunting Area 93, recording 15Hd460, revisiting 15Hd178, 15Hd182, and 15Hd282, and unsuccessfully attempting to relocate previously recorded site 15Hd283. Hemberger (1992) surveyed a 7.5 acre borrow area in Hunting Area 24, proposed to be used for the consolidation and improvement of two training ranges, and encountered no sites.

In conjunction with land sales, Ball (1987) surveyed approximately 196 acres in the Bullitt County portion of Fort Knox, recording sites 15Bu479 through 15Bu481 and describing one post-1950, or modern, house foundation. Ball (1991b) also surveyed a 19 acre tract near Radcliff prior to disposal of the tract, recording two historic/modern trash dumps which were not assigned state site numbers. Hale (1981) surveyed the Otter Creek Park, recording 15Md243 through 15Md303. Portions of Otter Creek Park, now owned by the City of Louisville, were once part of the Fort Knox military installation, but were disposed of in the 1970's.

Road construction and improvements have resulted in a number of CRM projects on the military reservation. McGraw (1976) surveyed the proposed U.S. 60 bridge and approaches near Otter Creek park, encountering no sites in a 2.35 mile long corridor which passes through Hunting Areas 7 through 9 and 11 and 12. Fiegal (1982) surveyed the Radcliff Industrial Park access road, including land in Hunting Area 15 as well as off the installation. He recorded 15Hd403 and 15Hd404 off the installation, and revisited 15Hd215 and 15Hd272 on the installation. Webb and Brockington (1986) surveyed the 4.75 mile long Kentucky Highway 1638 realignment corridor, which included portions of Hunting Areas 5 and 7 through 10. They revisited sites 15Md176, and 15Md182 through 15Md185, and recorded 15Md306, 15Md307, and 15Md309. Sites 15Md176, 15Md182, 15Md183, and 15Md307 were all parts of the former town of Garnettsville. The latter three sites were tested (Wheaton 1982), but 15Md176 was not tested because it fell outside the 1638 realignment easement. DiBlasi (1986) surveyed 14 alternative alignments of the approximately 20 km (12.4 miles) long Kentucky Highway 313

corridor, which includes portions of Hunting Areas 80 through 83 and 90, as well as land outside the installation. A total of 27 sites (15Hd406-15Hd430 outside the installation, and 15Hd135, 15Hd184, 15Hd186, 15Hd248, 15Hd249, 15Hd253, 15Hd431, and 15Hd432 on the installation), some previously recorded, were located in the survey corridor. Hixon (1992) tested 15Hd423 and 15Hd426, and archeologists from Wilbur Smith Associates tested six sites on the installation, including 15Hd249 and 15Hd253 (Fenton 1993: personal communication).

In addition to the CRM projects, several sites have been recorded on the military reservation in non-CRM contexts. Funkhouser and Webb (1932) published a catalog of archeological sites in the state, with the information gained primarily through correspondence with amateur archeologists, collectors, and local historians, and included the description of two sites now on the military reservation. These are 15Md10, a mound group on Indian Hill, and 15Md11, a mound near the mouth of Otter Creek (Funkhouser and Webb 1932: 281). Lee Hanson recorded 15Hd17 and 15Hd18, while attending ROTC training camp at Fort Knox in 1961 (Hanson 1961a, 1961b; Dr. R. Berle Clay 1991: personal communication). The wife of a soldier stationed at Fort Knox partially excavated 15Hd273, a mound in Hunting Area 6, in the early 1960's (Anonymous n.d.).

Of greatest relevance to the present study are the works of O'Malley et al. (1980) and DiBlasi (1986) who, as stated in the introduction, previously surveyed areas containing proposed Spoil Areas 4 and 1 through 3, respectively. In the section of Hunting Area 81, in which proposed Spoil Area 4 lies, O'Malley et al. (1980) recorded 15Hd131, 15Hd132, 15Hd135, and 15Hd250 through 15Hd254. These sites are all located 200 to 600 m from the proposed spoil area, and none are located on the ridge spur on which Spoil Area 4 is located. No sites, other than 15Hd135 and 15Hd253, were located within the portion of Hunting Area 81 traversed by DiBlasi's survey corridor.

The closest O'Malley et al. (1980) survey area to Spoil Areas 5 and 6 is located in Hunting Area 80. The southwest corner of the O'Malley et al. (1980) survey area is approximately 700 m northeast of Spoil Area 5 and the southeast corner is approximately 400 m north-northwest of Spoil Area 6. Sites 15Hd126, 15Hd129, 15Hd130, and 15Hd255 were recorded by O'Malley et al. (1980) in Hunting Area 80, but the closest sites to either Spoil Area 5 or 6 is located approximately 900 m distant. Site 15Hd420, recorded by DiBlasi (1986) just outside the installation boundary, lies approximately 800 m east-southeast of Spoil Area 6.

No sites other than those discussed above are recorded within a 1.0 km radius of the project areas. No archeological sites or standing structures listed on or eligible for

listing on the National Register of Historic Places are located in or immediately adjacent to the current project areas.

III. SURVEY PREDICTIONS

Bush et al. (1988:16) noted the following trends for sites recorded on the Fort Knox military reservation:

- 1) Historic sites are the most frequent site type.
- 2) Sites of indeterminate prehistoric cultural-temporal affiliation are the second most common site type.
- 3) Historic sites frequently have prehistoric components, suggesting that both prehistoric and historic peoples were selecting similar topographic features for settlement.

Based on previous archeological research in the area, the history of settlement, and the environmental setting of the proposed spoil areas, the following results were also expected:

- 1) Spoil Area 5 is located on a steep ridge slope and in a relatively narrow ravine cut by an intermittent tributary of Mill Creek. This is a low potential spot for either prehistoric or historic habitation.
- 2) Spoil Area 6 is located on a ridge top, overlooking the headwaters of several intermittent tributaries of Douglas Branch and Dorrets Run. Generally, this setting is considered a high potential locale for prehistoric sites. The fact that the ridge top is at least 500 m from any source of permanently flowing water and the fact that numerous hill and ridge tops exist nearby which are closer to permanent water sources, reduces the potential for a prehistoric site in this locale.
- 3) Many forested areas on the installation have been logged, as well as used for tank training or other military training exercises. Sites found in these areas are likely to be wholly or partially disturbed.

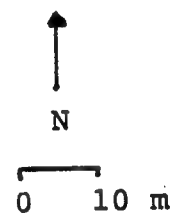
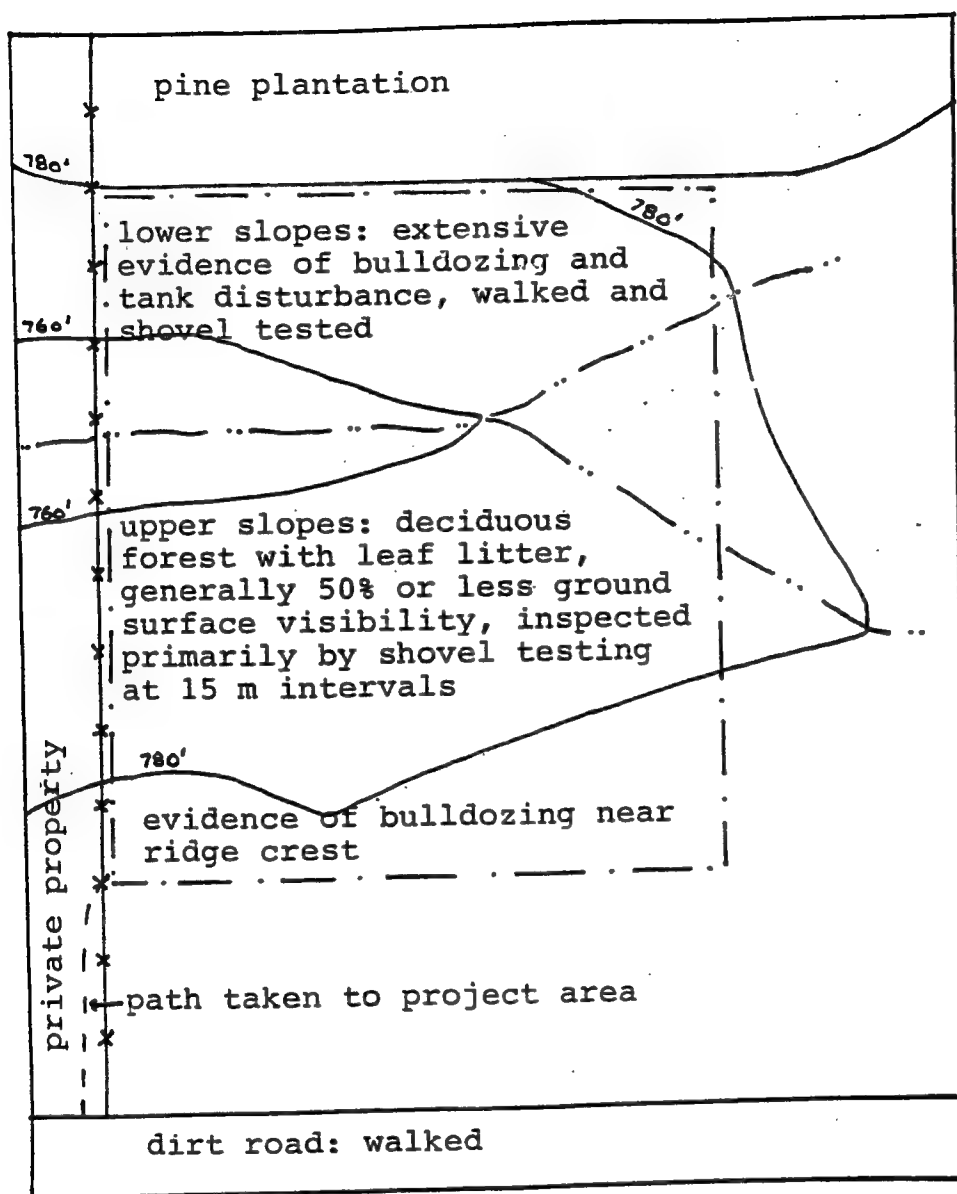
IV. SETTING AND FIELD METHODS

All of the proposed spoil areas surveyed lie in the Mississippian Plateau physiographic region of Kentucky (McGrain and Currens 1978:35). The terrain in all of the spoil areas surveyed is characterized by broad, flat-topped ridges adjoining narrow, steep walled stream valleys (McGrain and Currens 1978:35).

Spoil Areas 1 through 4 had been systematically surveyed in previous studies (DiBlasi 1986; O'Malley et al. 1980), with negative results, and were not field inspected in the current study. Spoil Areas 5 and 6 had not been previously surveyed, and the remainder of this section will focus on the description of the setting and field methods of these two areas.

Spoil Area 5 is located on the north slope of a ridge and on the lower portion of the south slope of an adjoining ridge (Figure 2). The north boundary of Spoil Area 5 is formed by a pine plantation, and the west boundary, by the fence line demarcating the boundary between the reservation and a privately owned farm. The east and north boundaries were not marked by any salient features, but were estimated using the boundaries and contour intervals indicated on the map attached to the Property Owner Agreement between Larry Glass Construction Co., Inc., and the United States Army, dated September 22, 1993 (Andrews 1993). The south boundary of the area surveyed lies approximately 40 m north of an existing road. The area surveyed was approximately 90 m long (north-south) by 80 m wide (east-west). The entire project area was in deciduous trees with scattered evergreens. Undergrowth was limited, but leaf cover was moderate to dense, with approximately 50 percent or less ground surface visibility. The northern 30 m of Spoil Area 5, at the base of the slopes, and the south margin of Spoil Area 5, on the upper north ridge slope, exhibited moderate to extensive disturbance from tank training and bulldozing.

Spoil Area 6 is located on a top and upper east slope of a ridge (Figure 3). The west boundary is formed by the boundary of the reservation, and the other boundaries were determined by pacing the distance from South Perimeter Road and matching topographic features shown on the map against actual features. The area surveyed is approximately 70 m long (north-south) by 50 m wide (east-west). The area was in deciduous forest, which had been logged in the past decade or so. Ground surface visibility was generally 50% or more, with many open patches. A dirt road leads into the project area from the south, and is rutted into the subsoil. This road is still in use for illegal garbage dumping, for a new looking split garbage bag was lying in a ravine near the southeast corner of the project area. The dirt road apparently once turned and continued westward down the ravines,



- Key: --- Boundary of Proposed Spoil Area 5/
area inspected.
- Boundary of military reservation/fence line.
- Intermittent drainage.

FIGURE 2. Plan View of Spoil Area 5.

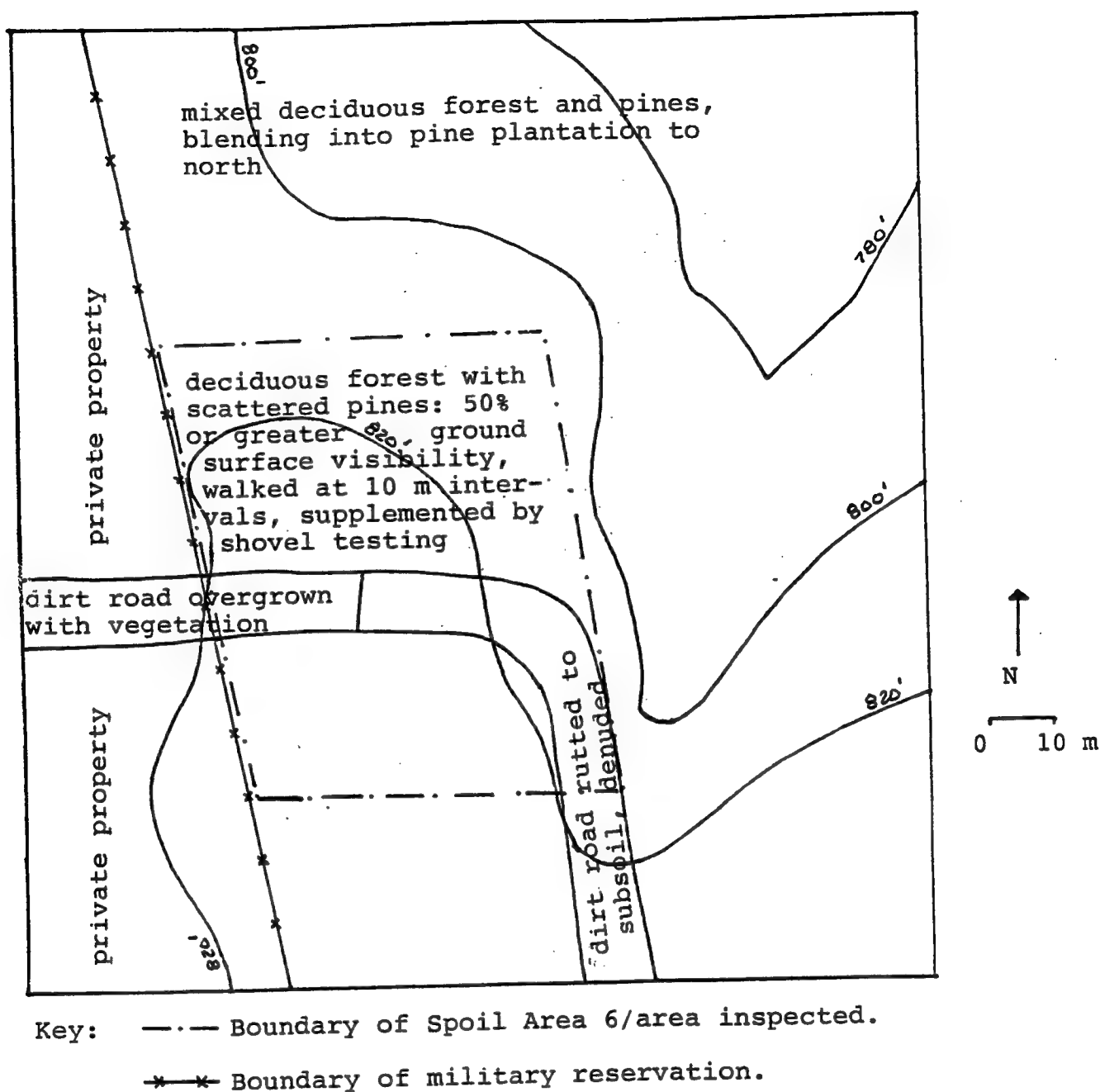


FIGURE 3. Plan View of Spoil Area 6.

but the west leg was overgrown, and since it entered private land it was not followed for any distance.

In general, Spoil Area 5 was systematically walked in east-west transects at paced 15 m intervals, and Spoil Area 6 was walked in transects at paced 10 m intervals. In order to increase the effective ground surface visibility in areas with dense ground cover or leaf litter, the denuded areas around bases of trees, deer paths, rodent burrows, and other patches of open ground were carefully examined when present. If the ground surface was obscured by vegetation for greater than 10 to 15 m within a transect, then a shovel test pit (STP) was excavated. Each STP excavated was approximately 30 cm square at ground surface and excavated to a depth of at least 30 cm, or until a sterile subsoil was encountered. The walls of each STP were scraped and inspected for evidence of archeological deposits. The fill from each STP was trowel-sorted for artifacts or other evidence of potential archeological deposits (e.g., charcoal flecks). The north ridge slope in Spoil Area 5 was inspected primarily by shovel testing, while all other areas of Spoil Area 5 and Spoil Area 6 were inspected through pedestrian reconnaissance, supplemented by shovel testing. No evidence of archeological materials or deposits were observed in either Spoil Area 5 or Spoil Area 6.

No information was given about access routes to the spoil areas, however, in the documents provided to the Staff Archeologist. The shortest possible access routes to Spoil Areas 1 through 3 from the north boundary of the Highway 313 easement lie within the corridor surveyed by DiBlasi (1986) and contain no reported sites. The expected access route to Spoil Area 4, along the ridge crest, lies within the area surveyed by O'Malley et al. (1980) and contains no reported sites.

Spoil Area 5 lies only approximately 30 m north of an existing dirt road, and this dirt road merges with the Highway 313 easement just west of the proposed Spoil Area. This road was inspected by walkover, and no artifacts were observed. The south boundary of Spoil Area 5 and the margin of the road showed evidence of having been bulldozed several years ago, and the area between the road and Spoil Area 5 is expected to be previously disturbed.

At the time of survey, the ground clearing of the Highway 313 easement had not been near enough to proposed Spoil Area 6 to determine the most likely access route to the spoil area. A dirt road leads into Spoil Area 6 from the south, and once continued westward through the spoil area and off the installation onto private property. If the contractor uses this existing access road, no impact to any significant cultural resource is expected, since the road is already eroded into subsoil.

V. CONCLUSIONS AND RECOMMENDATIONS

The Phase I literature search of proposed Spoil Areas 1 through 6 revealed that tracts to be used for Spoil Areas 1 through 4 had been previously inspected by O'Malley et al. (1980) or DiBlasi (1986). No evidence of archeological materials or deposits had been found in Spoil Areas 1 through 4 in these earlier surveys, so Spoil Areas 1 through 4 were not field inspected in the current study. Spoil Areas 5 through 6 had not been previously surveyed, and were field inspected in the current study. The inspection of Spoil Areas 5 and 6 resulted in the discovery of no archeological materials or deposits. It is recommended that Glass Contractors be permitted to use the spoil areas as proposed.

The contractor, and not the landowner, is typically responsible for Section 106 compliance. Because Fort Knox is a federal agency and therefore is obligated to inventory and protect cultural resources by the various laws cited in the introduction, and because Fort Knox has an archeologist on staff, the installation assumed the responsibility for having the spoil areas examined for cultural resources. No information was given about access routes to the spoil areas, however, in the documents provided to the Staff Archeologist. The shortest, most logical, access routes to Spoil Areas 1 through 4 from the north boundary of the Highway 313 easement lie in areas previously surveyed (DiBlasi 1986; O'Malley et al. 1980), with negative results. Spoil Area 5 lies approximately 30 m north of an existing dirt road, and this dirt road merges with the Highway 313 easement just west of the proposed Spoil Area. No evidence of archeological materials or deposits was observed in the portion of the road south of proposed Spoil Area 5, and the area between the road and Spoil Area 5 is expected to be previously disturbed by bulldozing. A dirt road leads into Spoil Area 6 from the south, and once continued westward through the spoil area and off the installation onto private property. If the contractor uses this existing access road, no impact to any significant cultural resource is expected. If the contractor uses an access route other than this road, this access route should be surveyed prior to use of Spoil Area 6. If the route lies off the installation, the inspection of the route is out of the purview of the Fort Knox Staff Archeologist and the contractor will be responsible for hiring an archeological consultant.

In the remote possibility that archeological materials are discovered during the deposition of soil spoil, all activity in the vicinity of the finds must cease and the State Historic Preservation Officer (502-564-6661) and the DPW staff archeologist (502-624-6581) should be contacted, so a representative of those agencies may evaluate the materials. Also, if human remains, regardless of age or cultural

affiliation, are discovered, all activity in the vicinity of the remains must cease immediately, and the state medical examiner (502-564-4545) and the appropriate local law enforcement agency (Fort Knox Law Enforcement Command, 502-624-6852) must be contacted, as stipulated in KRS 72.020.

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APPENDIX A. RESUME OF PRINCIPAL INVESTIGATOR

Pamela A. Schenian

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Date and Place of Birth: January 1, 1959; Waukesha, WI.

Present Position: J.M. Waller & Associates/Fort Knox Staff
Archeologist and Cultural Resource Manager

Education:

A.B.D. in Anthropology, Northwestern University, 1984.
M.A. in Anthropology, Northwestern University, 1982.
A.B. in Anthropology, Bryn Mawr College, 1980.

Previous Employment:

Senior Staff Archeologist, Archeology Service Center,
Department of Sociology, Anthropology, and Social Work, Mur-
ray State University, Murray, KY, November 1991-June 1993;
Staff Archeologist, November 1983-November 1991.

Southern Illinois University, Carbondale, IL: Field
Technician, November-December 1985, September-October 1984.

Illinois State Museum Society, Springfield, IL: Field
Assistant II (Supervisor), summer 1983; Field Technician,
summer 1981.

Center for American Archeology, Kampsville, IL: Field
Technician, summer 1982.

Department of Anthropology, Northwestern University,
Evanston, IL: Teaching Assistant, 1981-82 academic year.

Great Lakes Archeological Research Center, Milwaukee,
WI: Field Technician, summer 1979.

Field Research Experience:

Field experience on prehistoric and historic archeologi-
cal projects in the states of Illinois, Indiana, Kentucky,
New Jersey, South Dakota, Tennessee, and Wisconsin, 1979-
present.

Professional Publications, Reports, Papers and Manuscripts:
84 CRM contract reports on projects in Kentucky and Ten-
nessee.

1 Homicide site excavation contract report prepared in lieu
of court testimony in Illinois.

7 Papers presented at professional conferences.

5 Publications.

Doctoral candidacy qualifying paper: "A Theory of Individ-
ual Style Variation for Archeological Studies".

Manuscript submitted in partial fulfillment of the M.A.
requirements: "Models of Environmental-Cultural Relation-
ships: Testing with Archeological Evidence".